

<110> Awasthi, Sanjay Singhal, Sharad S.

<120> Liposomes For Protection Against Toxic Compounds

<130> 124263-1006

<140> US 10/713,578

<141> 2003-11-13

<150> 60/425,814

<151> 2002-11-13

<160> 2

<170> PatentIn version 3.3

<210> 1

<211> 655

<212> PRT

<213> recombinant

<400> 1

Met Thr Glu Cys Phe Leu Pro Pro Thr Ser Ser Pro Ser Glu His Arg

1 10 15

Arg Val Glu His Gly Ser Gly Leu Thr Arg Thr Pro Ser Ser Glu Glu 20 25 30

Ile Ser Pro Thr Lys Phe Pro Gly Leu Tyr Arg Thr Gly Glu Pro Ser 35 40 45

Pro Pro His Asp Ile Leu His Glu Pro Pro Asp Tyr Val Ser Asp Asp 50 55 60

Glu Lys Asp His Gly Lys Lys Gly Lys Phe Lys Lys Glu Lys 65 70 75 80

Arg Thr Glu Gly Tyr Ala Ala Phe Gln Glu Asp Ser Ser Gly Asp Glu
85 90 95

Ala Glu Ser Pro Ser Lys Met Lys Arg Ser Lys Gly Ile His Val Phe 100 105 110

Lys Lys Pro Ser Phe Ser Lys Lys Glu Lys Asp Phe Lys Ile Lys 115 120 125

Glu Lys Pro Lys Glu Glu Lys His Lys Glu Glu Lys His Lys Glu Glu Lys His Lys Glu Lys Lys Ser Lys Asp Leu Thr Ala Ala Asp Val Val Lys Gln Trp Lys Glu Lys Lys Lys Lys Lys Pro Ile Gln Glu Pro Glu Val Pro Gln Ile Asp Val Pro Asn Leu Lys Pro Ile Phe Gly Ile Pro Leu Ala Asp Ala Val Glu Arg Thr Met Met Tyr Asp Gly Ile Arg Leu Pro Ala Val Phe Arg Glu Cys Ile Asp Tyr Val Glu Lys Tyr Gly Met Lys Cys Glu Gly Ile Tyr Arg Val Ser Gly Ile Lys Ser Lys Val Asp Glu Leu Lys Ala Ala Tyr Asp Arg Glu Glu Ser Thr Asn Leu Lys Asp Tyr Glu Pro Asn Thr Val Ala Ser Leu Leu Lys Gln Tyr Leu Arg Asp Leu Pro Glu Asn Leu Leu Thr Lys Glu Leu Met Pro Arg Phe Glu Glu Ala Cys Gly Arg Thr Thr Glu Thr Glu Lys Val Gln Glu Phe Gln Arg Leu Leu Lys Arg Leu Pro Glu Cys Asn Tyr Leu Leu Ile Ser Trp Leu Ile Val His Met Asp His Val Ile Ala Lys Glu Leu Glu Thr Lys Met Asn Ile Gln Asn Ile Ser Ile Val Leu Ser Pro Thr Val Gln Ile

Ser Asn Arg Val Leu Tyr Val Phe Phe Thr His Val Gln Glu Leu Phe 355 360 365

Gly Asn Val Val Leu Lys Gln Val Met Lys Pro Leu Arg Trp Ser Asn $370 \hspace{1cm} 375 \hspace{1cm} 380$

Met Ala Thr Met Pro Thr Leu Pro Glu Thr Gln Ala Gly Ile Lys Glu 385 390 395 400

Glu Ile Arg Arg Gln Glu Phe Leu Leu Asn Cys Leu His Arg Asp Leu 405 410 415

Gln Gly Gly Ile Lys Asp Leu Ser Lys Glu Lys Arg Leu Trp Glu Val 420 425 430

Gln Arg Ile Leu Thr Ala Leu Lys Arg Lys Leu Arg Glu Ala Lys Arg 435 440 445

Gln Glu Cys Glu Thr Lys Ile Ala Gln Glu Ile Ala Ser Leu Ser Lys 450 455 460

Glu Asp Val Ser Lys Glu Glu Met Asn Glu Asn Lys Glu Val Ile Asn 465 470 475 480

Ile Leu Leu Ala Gln Glu Asn Glu Ile Leu Thr Glu Gln Glu Leu 485 490 495

Leu Ala Asn Glu Gln Phe Leu Arg Arg Gln Ile Ala Ser Glu Lys Glu 500 505 510

Glu Ile Glu Arg Leu Arg Ala Glu Ile Ala Glu Ile Gln Ser Arg Gln 515 520 525

Gln His Gly Arg Ser Glu Thr Glu Glu Tyr Ser Ser Glu Ser Glu Ser 530 540

Glu Ser Glu Asp Glu Glu Glu Leu Gln Ile Ile Leu Glu Asp Leu Gln 545 550 555 560

Arg Gln Asn Glu Glu Leu Glu Ile Lys Asn Asn His Leu Asn Gln Ala 565 570 575

Ile His Glu Glu Arg Glu Ala Ile Ile Glu Leu Arg Val Gln Leu Arg

580 585 590

Leu Leu Gln Met Gln Arg Ala Lys Ala Glu Gln Gln Ala Gln Glu Asp 595 600 605

Glu Glu Pro Glu Trp Arg Gly Gly Ala Val Gln Pro Pro Arg Asp Gly 610 615 620

Val Leu Glu Pro Lys Ala Ala Lys Glu Gln Pro Lys Ala Gly Lys Glu 625 630 635 640

Pro Ala Lys Pro Ser Pro Ser Arg Asp Arg Lys Glu Thr Ser Ile 645 650 655

<210> 2

<211> 1974

<212> DNA

<213> human bone marrow

<400> 2

atgactgagt gcttcctgcc ccccaccagc agccccagtg aacaccgcag ggtggagcat 60 ggcagcgggc ttacccggac ccccagctct gaagagatca gccctactaa gtttcctgga 120 ttgtaccgca ctggcgagcc ctcacctccc catgacatcc tcatgagcct cctgatgtag 180 240 tgtctgatga tgagaaagat catgggaaga aaaaagggaa atttaagaaa aaggaaaaga qqactqaaqq ctatqcaqcc tttcaqqaaq ataqctctqq aqatqaqqca qaaaqtcctt 300 ctaaaatqaa qaqqtccaaq qqaatccatq ttttcaaqaa qaaqcccaqc ttttctaaaa 360 agaaggaaaa ggattttaaa ataaaagaga aacccaaaga agaaaagcat aaagaagaaa 420 gcacaaagaa gaaaaacata aagagaagaa gtcaaaagac ttgacagcag ctgatgttgt 480 taaacagtgg aaggaaaaga agaaaaagaa aaagccaatt caggagccaq aggtgcctca 540 gattgatgtt ccaaatctca aacccatttt tggaattcct ttggctgatg cagtagagag 600 gaccatgatg tatgatggca ttcggctgcc agccgttttc cgtgaatgta tagattacgt 660 agagaagtat ggcatgaagt gtgaaggcat ctacagagta tcaggaatta aatcaaaggt 720 ggatgagcta aaagcagcct atgaccggga ggagtctaca aacttggaag actatgagcc 780 taacactgta gccagtttgc tgaagcagta tttgcgagac cttccagaga atttgcttac 840 caaagaqctt atgcccaqat ttgaaqaqqc ttgtqqqaqq accacqqaqa ctqaqaaaqt 900 gcaggaattc cagcgtttac tcaaaqaact gccagaatgt aactatcttc tgatttcttq 960

1020 gctcattgtg cacatggacc atgtcattgc aaaggaactg gaaacaaaaa tgaatataca 1080 gaacatttct atagtqctca gcccaactgt gcagatcagc aatcgagtcc tgtatgtgtt 1140 tttcacacat gtgcaagaac tctttggaaa tgtggtacta aagcaagtga tgaaacctct 1200 gcgatggtct aacatggcca cgatgcccac gctgccagag acccaggcgg gcatcaagga 1260 ggagatcagg agacaggagt ttcttttgaa ttgtttacat cgagatctgc agggtgggat aaaggatttg tctaaagaag aaagattatg ggaagtacaa agaattttga cagccctcaa 1320 aagaaaactg agagaagcta aaagacagga gtgtgaaacc aagattgcac aagagatagc 1380 cagtctttca aaagaggatg tttccaaaga agagatgaat gaaaatgaag aagttataaa 1440 tattctcctt gctcaggaga atgagatcct gactgaacag gaggagctcc tggccatgga 1500 1560 gcagtttctg cgccggcaga ttgcctcaga aaaagaagag attgaacgcc tcagagctga 1620 gattgctgaa attcagagtc gccagcagca cggccgaagt gagactgagg agtactcctc 1680 cgagagcgag agcgagagtg aggatgagga ggagctgcag atcattctgg aagacttaca 1740 gagacagaac gaagagctgg aaataaagaa caatcatttg aatcaagcaa ttcatgagga gegegaggee atcategage tgegegtgea getgeggetg etceagatge agegageeaa 1800 1860 ggccgagcag caggcgcagg aggacgagga gcctgagtgg cgcgggggtg ccgtccagcc 1920 gcccagagac ggcgtccttg agccaaaagc agctaaagag cagccaaagg caggcaagga 1974 gccggcaaag ccatcgccca gcagggatag gaaggagacg tccatctgad aasv